BLI

Lab Test Report

A Comprehensive BLI Laboratory Evaluation | JUNE 2011

HP Color LaserJet Enterprise CM4540f MFP

42 PPM Color Print • Copy • Scan • Fax

BUYERS LABORATORY 2011 BLI HIGHLY RECOMMENDED LAB TESTED

Reliability	Excellent
Multitasking	Very Good
Administrative Utilities	Excellent
Feedback to Workstations	Good
Ease of Network Setup	Very Good
Print Drivers	Very Good
Applications Compatibility	Excellent
Scan Functions	Very Good
Color/Black Print Quality	Very Good
Color/Black Copy Quality	Good
Color/Black Print Productivity	Very Good/Good
Color/Black Copy Productivity	Good
Ease of Use	Very Good
Feature Set	Very Good
Security Features	Not Rated
Environmental Features	Not Rated
Toner Yield	Very Good
Cost per Page	5.711¢
Value	Very Good

BLI RECOMMENDATION

Targeted to SMBs and midsize workgroups, the Color LaserJet Enterprise CM4540f MFP gave a stellar performance throughout its lab evaluation. For starters, the A4 unit carries a lower than average purchase price, which when combined with a competitive cost per page and several productivity-boosting and/or money-saving features, translates into a very good value play. HP ePrint functionality lets mobile users send jobs to the unit, while the manufacturer's OXPd architecture enables seamless integration with solutions developed by HP and third parties. Compatibility with the HP Universal Print Driver (UPD), which helps achieve streamlined driver deployment, is also a tremendous asset; like with HP Web Jetadmin and the embedded Web server, it provides administrators with extensive tools to control color usage. A hallmark of HP devices has always been ease of use—the Color LaserJet Enterprise CM4540f MFP unit is no exception: With simple routine maintenance procedures and perfect reliability over 87,500 impressions, downtime is virtually guaranteed to be minimal. Other nice strengths of the unit include crisp text and consistent line art in print mode, and simple procedures for scanning a document to an e-mail address or network folder. BLI highly recommends the Color LaserJet Enterprise CM4540f MFP for environments with monthly print volumes of up to 9,000 impressions.

Test duration: Two months, including an 87,500-impression durability test.

Manufacturer's maximum recommended monthly volume: 175,000 impressions.

Manufacturer's recommended monthly volume: 5,000 to 9,000 impressions.

BLI's recommended monthly volume for optimum performance: Up to 9,000 impressions.

More information on the HP Color LaserJet Enterprise CM4540f MFP is available through bliQ (www.buyerslab.com/bliQ).

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STRENGTHS

- Highly reliable—flawless durability performance
- Lower than average purchase price
- ePrint functionality allows mobile users to send print jobs to the unit; built on HP's OXPd platform for seamless integration with third-party solutions
- Simple routine maintenance procedures
- The flexible and robust Web Jetadmin makes managing a fleet of mixed hardware on the network easy; administrators can limit or prohibit color usage
- Compatible with UPD, which simplifies driver distribution and allows for additional color controls
- Bright saturation in business graphics and a broad color halftone range in photographic images in print mode; color print output remained consistent throughout testing; crisp text, consistent line art, and excellent transitions from light to dark shades in black photographic images in print mode; broad grayscale range in print and copy modes
- Fast actual running speed in color mode in BLI's job stream; fast first-print time for the TIFF file; fast first-page time from overnight sleep; fast actual running speed when copying multiple sets in 1:1 auto-color and full-color modes
- High standard RAM and paper capacities; supports a wide range of media from the drawers; optional wireless connection
- Standard automatic duplexing contributes to less paper waste; Instant-on technology requires less energy to reach fusing temperature
- Simple process for scanning a document to an e-mail address or network folder; scan to/print from USB; fast scan speed in full-color simplex mode; smaller than average scan-file size in color mode
- High tested toner yields for black and yellow; average tested yields for all colors exceeded the declared specifications; high tested impressions-per-gram yields for all colors

WEAKNESSES

- Low maximum RAM capacity
- Slow scan speed in black duplex mode
- End users must be proactive in obtaining feedback

TEST RESULTS AND OBSERVATIONS

+, – and ○ represent positive, negative and neutral attributes, respectively.

△ RELIABILITY — EXCELLENT

+ The unit is certified highly reliable by BLI, completing an 87,500-impression (and 17,500 scan) durability test with nary a misfeed and no service required.

PMs/Malfunctions	Service Required	Meter Count (Impressions)	ADF Count (Scans)
Starting Meter Count		0	0
Ending Meter Count		87,500	17,500
Total Misfeeds/Misfeed Rate		0/Not applicable	0/Not applicable
Service Calls	0		

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MULTITASKING

VERY GOOD

○ The unit downloads one print job at a time from the network queue to the print queue.

\+ When a print job is being output, users can program scan jobs or reserve copy jobs, the latter to memory capacity.

\+ Users don't have to press a button to reserve the next copy job.

○ Typical of devices in this class, there's no interrupt function.

○ Jobs are processed on a first-in, first-out basis. Priority mode can't be changed.

Multitasking

Primary Function \ Secondary Function	Print	Scan	Copy
Print	Yes	Yes	Yes
Scan	Yes	*	*
Copy	Yes	Yes	Yes

* As soon as the document feeder is free the secondary function can be programmed; however, the primary function is already complete. (2)

(X) indicates number of occurrences. A "Yes" indicates that the user can initiate the secondary function while the primary function is taking place and that no further user intervention will be required for the secondary function to take place.

ADMINISTRATIVE UTILITIES

EXCELLENT

\+ Web Jetadmin allows for management of an entire fleet of mixed hardware. Administrators can simultaneously configure and diagnose multiple devices, set up alert notifications, enforce duplexing, and establish when devices should enter energy-save mode. Also, because Web Jetadmin integrates with Microsoft Active Directory, administrators don't have to perform an IP broadcast to find devices on the network as it does so automatically. All users can access the utility to check status and monitor supply levels. Web Jetadmin integrates with HP OpenView, IBM Tivoli, and Computer Associates Unicenter, too.

\+ Via Web Jetadmin, administrators have a choice of different security features: SSL/TLS, which encrypts information passed between the utility's host machine and Web browsers using HTPPS; with login passwords, administrators can prevent unauthorized users from accessing the utility and determine the features and functions that certain users can take advantage of; and profiles can be created and customized by administrators to only allow access to each individual user, for instance, a helpdesk employee, who can usually just view information but not change settings.

\+ PC printer discovery, report generation and other functions are core capabilities of Web Jetadmin 10.2. Another key facet of the utility is the HP driver pre-configuration function; with this, administrators can create monochrome print queues so specified users or workgroups associated with those queues can only print in black.

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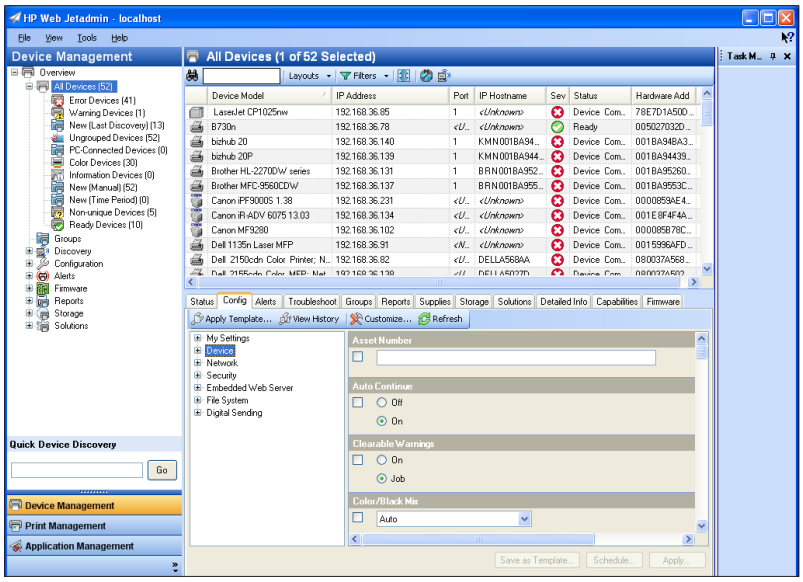
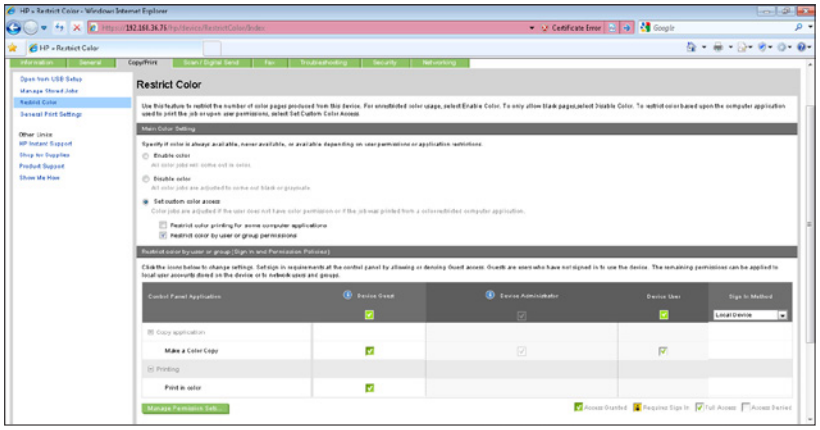


Web Jetadmin 10.2 has a task-based interface modeled on a Windows application and provides drag-and-drop functionality and right-click capability, as well as single sign-on using existing Microsoft user profiles. Automated tools such as backup and restore scripts make it easier to upgrade from the previous version.

+ Administrators can manage the unit and the address book, as well as to configure and print usage reports, among a host of other things, via the embedded Web server. All users can access the utility to view device and consumables status, or perform direct printing of PDF, PRN and PostScript files. Though the embedded Web server can be password-protected, by default it's not.



Using the embedded Web server, administrators can restrict or limit access to color output by specifying up to 50 users and whether or not they're allowed to print or copy in color. Additionally, administrators can designate up to 10 applications for which to allow or prohibit color printing, or create default permissions for users or applications not specified in the lists. Color access controls are also offered in Web Jetadmin and the Universal Print Driver.

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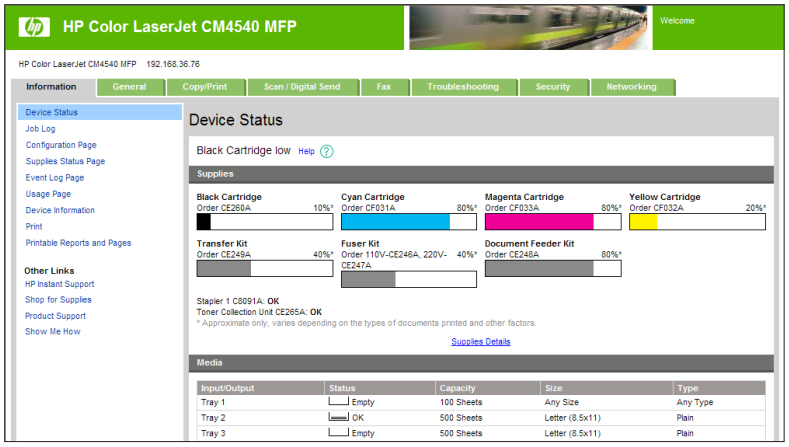
+ Administrators can use the Managed Printing Administration component of the UPD to customize job, device, and supplies status notifications, as well as to completely shut down color capability until it's deemed necessary. This ensures that the users who genuinely need color have access to it, while all others are automatically defaulted to printing in monochrome only.

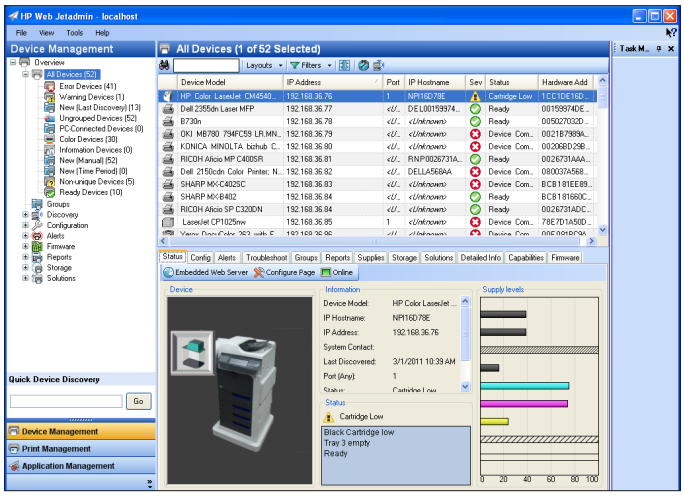
FEEDBACK TO WORKSTATIONS

GOOD

— No pop-up messages or icon alerts are available. Therefore, end users must be proactive in obtaining device and consumables status. Many competitive devices come with a feedback utility that provides these capabilities.



All users can see device status and color-coded gauges for toner levels on the main screen of the embedded Web server. Also listed are the transfer, fuser, and document feeder kits, as well as icons for paper input and output. Text is given in addition to the gauges and icons. Users can access the status page of the embedded Web server via a link in the driver.



Web Jetadmin provides a preview of the highlighted device that includes a snapshot of details, including device and toner status.

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+ Web Jetadmin and the embedded Web server can be configured to send e-mail alerts to designated personnel when errors occur or supplies need to be reordered.

△ EASE OF NETWORK SETUP — VERY GOOD

+ Due to size and weight concerns, HP recommends at least two people roll the unit out of the box and to the desired location. Shipping materials consist of Styrofoam and HP ClearView packaging, which is made from recycled milk bottles. Users also don't have to break any seals or remove locks from the preinstalled standard-yield (8,500 pages for black, 12,500 pages each for cyan, magenta and yellow) print cartridges.

+ The finisher, which has a cantilevered design, ships in a separate box and is easy to install. Users open the top of the unit and pull off the metal plate on the left side; the finisher can then be attached to the unit by lining up the entry points with the guides and inserting.

+ The disc launches when inserted in the drive, and the automated installation process makes for simple setup on the network. It takes five clicks to install the PCL 6 driver via the default routine. The IP address is assigned, the port is created, and the driver detects configured accessories, all automatically.

○ Downloadable from HP's Web site, the UPD for PCL 5c or PostScript 3 printing requires a separate installation.

○ Web Jetadmin can also be downloaded for free from the company's Web site, and organizations are urged to frequently check back for the most recent version of the utility.

+ With Web Jetadmin, administrators can create a template of settings and copy them to other Color LaserJet Enterprise CM4540 devices on the network, as well as to configure drivers and remotely install them on multiple workstations.

○ The Administrator Options tab on the CD includes the Installer Customization Wizard, which is used to create custom driver installation packages that can be distributed to users for uniform operation across the organization. Additionally, administrators can either install every part of the software or pick and choose specific aspects; however, users then perform the installation themselves.

○ The disc also includes the fax driver, user manual, and links to Web Jetadmin and the UPD downloads.

△ PRINT DRIVERS — VERY GOOD

○ The unit ships with a Microsoft-certified PCL 6 driver that's compatible with various Windows operating systems, as well as Mac OS X 10.4 or later.

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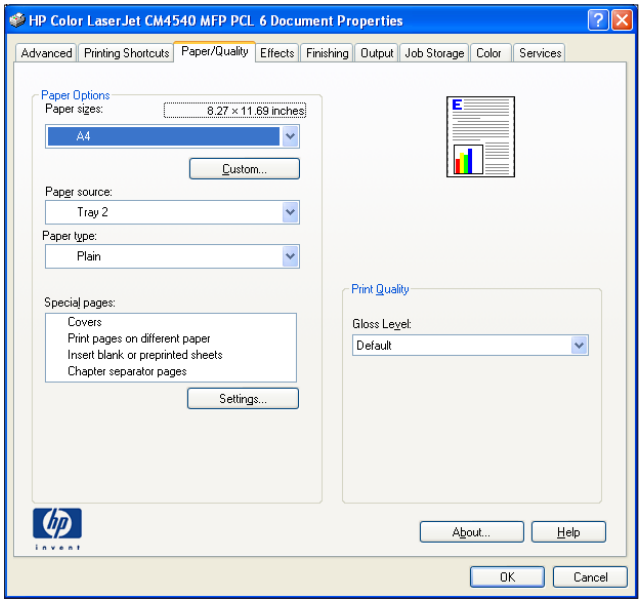
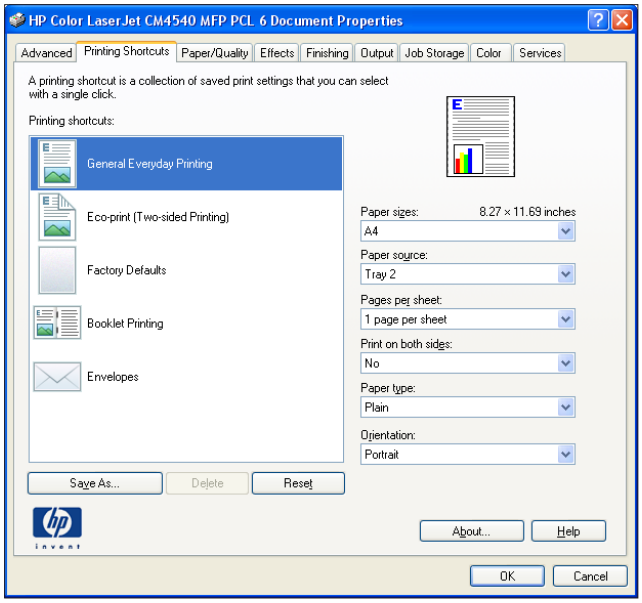
+ The UPD (not tested) gives users the luxury of printing to nearly any HP device (and select Canon devices) on the network with a single driver, eliminating the need to install separate ones for multiple pieces of hardware. Additionally, the UPD has a dynamic mode that allows mobile users to locate and print to HP devices on the network when working in different offices.



The PCL driver is graphical and easy to use, and all features required for a basic job are on the Paper/Quality tab, save for quantity.



The driver has a Printing Shortcuts tab (main screen), where users can select common job types with a single click, and save custom settings.

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○ The driver has a link that takes users to the embedded Web server so they can view device and consumables status prior to sending a job.

○ While it would be beneficial to have a toner-save or draft mode, which help extend the life of the cartridges, most devices in this class don't offer either.

○ File size doesn't increase when selecting collate in the application.

HP Color LaserJet Enterprise CM4540f MFP Print Driver Features

	PCL 6
Auto Feature/Device Detection	Yes
Booklet Printing	Yes
Collate	Yes*
Max Paper Sources per Job	3
Mirror Image	No
Negative Image	No
N-up Printing	2 to 16
Overlay	No
Paper Gauge	No (link to Web utility)
Print and Hold	Yes
Proof Print	Yes
Quantity Selection	9,999
Reduction/Enlargement	Auto, 25 to 400%
Resolution Modes	ImageREt 3600 (600 dpi)
Save Settings	Yes
Secure Print	Yes
Watermarks/Custom Watermarks	Yes/Yes
Cover Mode	Yes (front and back)
Poster Mode	No
Separator Pages	Yes
Toner Gauge	No (link to Web utility)
Toner Save	No
Print All Text as Black	No

* Though there's a collate selection in the driver, it didn't function properly in testing; collate must be selected from the Windows print screen within the application for output to be collated. This isn't uncommon, as most drivers are written to allow the application settings to carry an override.

APPLICATIONS COMPATIBILITY

EXCELLENT

+ No problems were experienced with any of the test files used in the applications compatibility tests. Units are tested for compatibility on Windows 2000 platforms with Microsoft Word 2000, PowerPoint 2000 and Excel 2000, as well as Adobe PageMaker 7.0, Photoshop 6.0 and Acrobat 8.0, using 25 application test files that contain text, graphics, halftone images, tables, etc., enabling BLI technicians to evaluate memory usage, file processing, font rendering and grayscale capability.

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△ SCAN FUNCTIONS

VERY GOOD

+ Users can scan to e-mail, network folders via FTP, and Internet fax in auto color, full color, black, or black/gray, at various resolutions from 75 to 600 dpi. Supported file formats include JPEG, PDF and PDF/A, TIFF and MTIFF, and XPS.

+ Scan preview for digital send jobs lets users view, add, delete or reorder pages at the control panel before sending the job.

+ Standard scan to/print from USB offers increased document portability, allowing workers to quickly save or output a file and leave the office. Supported file formats include PDF, PRN, PCL, PS, and CHT.

○ Should users want to program features for a scan job rather than employing the default settings, they must move back and forth between screens.

+ Users can easily send a file to multiple e-mail addresses, too. Destination entry is greatly aided by the display's QWERTY keypad, which has comfortably spaced, responsive keys and a dedicated "@" button to the left of the space bar. Addresses can be saved to the unit on the fly, while administrators can update the book via the embedded Web server.

○ Scan speed in auto-color simplex and duplex modes, full-color duplex mode, and black simplex mode is competitive compared with legal-size color laser/LED printer MFPs in this class tested to date. And while scan speed in black duplex mode is slower than average, it's faster than average in full-color simplex mode.

○ While scan-file size using the best compression in color mode is smaller than average compared with legal-size color laser/LED printer MFPs in this class tested to date, it's competitive in black mode.

+ With optional HP DSS 4.9, users can scan a file and send it to multiple network locations (e-mail addresses, secure e-mail, network folder, and LAN or Internet fax), as well as output it, simultaneously. Date/time information and alphanumeric data can be added. Administrators can also program job keys with frequently used indexing settings and destinations to help streamline the process. Acceptable send locations include network folders, FTP, printers, e-mail and a variety of third-party applications such as IBM FileNet. DSS also utilizes an IRIS Readiris OCR engine for converting static image files to editable, searchable digital documents. Available output formats include PDF, PDF/A, high compression PDF, RTF, TXT, HTML and XML. Configuration templates can be created, allowing users to apply the same settings to scanned documents from virtually any HP scanning device connected to the network.

+ Via the digital sending security setting, administrators can require users to log in before performing any type of scan job.

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Scan Speed in IPM

	HP Color LaserJet Enterprise CM4540f MFP	COMPETITIVE AVERAGE
AUTO COLOR		
1:1	31.4	33.3
2:2	19.4	21.3
FULL COLOR		
1:1	33.8	27.5
2:2	19.2	21.9
BLACK		
1:1	31.3	31.1
2:2	19.4	29.6

Files are scanned at 300 dpi in PDF format.

Scan-File Size in KB

	Low	Medium (Default)	High
FULL COLOR	444	748	1,126.4
BLACK	45	44.8	43.3

Testing is conducted with single-page files scanned at 300 dpi in PDF format.

COLOR/BLACK PRINT QUALITY

VERY GOOD

+ While BLI technicians noted slightly dark contrast in business graphics, and competitive sharpness of fine details and production of pastel shades, background reproduction and consistency of solids were above average; saturation was bright. Photographic images appeared somewhat grainy, with competitive sharpness of details and slightly reddish flesh tones, but color halftones were produced over a broad range.

+ The color gamut remained consistent over the course of testing, with only minimal fluctuation in the blue and red ranges at the 23,333-impression reading. Print quality samples taken at the start and end of the evaluation appeared identical, so organizations with heavy color demands can be assured that there's little to no degradation as the print cartridges are nearing expiration.

+ Characters were fully formed, dark and sharp, and production of curves/serifs was smooth. While circles showed some evidence of breakup, closely spaced fine lines remained distinct, lines were of a consistent thickness, and diagonal lines were free of any stair-stepping. No overspray was visible in text and line art. Grayscale was produced over a broad range with distinct separation between all levels, while coverage with halftone levels was smooth and had no banding. Solids exhibited average darkness, as well as competitive consistency of coverage.

+ The unit has an automatic media sensing feature that automatically detects paper weight and finish (i.e. matte or glossy), and makes adjustments to the unit to ensure optimum output.

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- HP ColorSphere chemically grown toner is composed of particles that are more consistent in size and shape than conventional ones, allowing for higher gloss and a wider range of colors than the previous formulation, according to the manufacturer.

- HP also claims its Smart print supplies have sensors that detect changes throughout the life of the cartridges and auto-adjust to optimize density and calibration.

Print Quality

Text	Excellent
Line Art	Excellent
Halftone Pattern	Excellent
Halftone Range	Very Good
Solids	Good
Color Business Graphics	Very Good
Color Photographic Images	Very Good
Color Shift	Very Good

Comments:

Color print quality is tested using the ANSI standard IT8 Color Test Target with print samples taken at five evenly spaced intervals throughout the test period. The ANSI IT8 Color Test Target is read using a Minolta CM503I Spectrophotometer and samples are analyzed using the CIE XY Chromaticity Diagram. The unit employs an internal automatic color calibration process.

Color Shift Readings

Test Point	Delta E	BLI Rating
23,333	3.58	Very Good
45,208	3.04	Very Good
71,458	2.57	Very Good
87,500	2.51	Very Good

Delta E is a colorimetric measurement assessing the distance between colors. The readings above reflect the average shift of the color gamut from the previous measured point.

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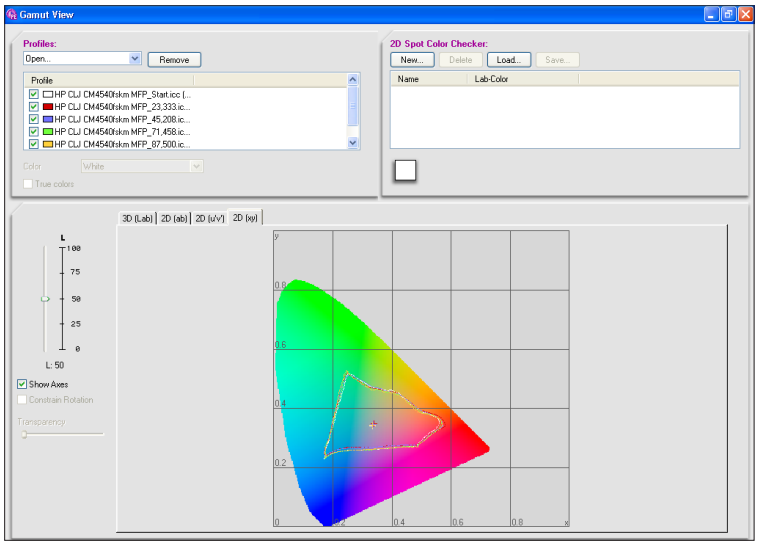

HP Color LaserJet Enterprise CM4540f MFP Color Gamut

Color Density Readings

Cyan	1.38
Magenta	1.15
Yellow	0.84

Density of a printed image with blocks of all solid colors (based on the average of two readings for each color).

Print Density

HP Color LaserJet Enterprise CM4540f MFP	1.31 to 1.39
Density for devices in this class tested to date	0.86 to 1.74

Measurements are based on four readings corresponding to four different solid black locations on output. The higher the density reading, the darker the image.

Halftone Range

HP Color LaserJet Enterprise CM4540f MFP	3 to 98%
Typical range for competitive units	4 to 96%

COLOR/BLACK COPY QUALITY

GOOD

○ While background reproduction and production of pastel shades in business graphics were above average, consistency of solids and sharpness of fine details were competitive; saturation wasn't bright enough, leading to "flat" colors in some cases. And though flesh tones were natural, some photographic images were grainy, and the unit produced an average range of halftones.

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- Characters were fully-formed and dark, with competitive sharpness, but production of curves/serifs was below average. Consistency of line thickness was competitive, as was production of closely spaced fine lines, while circles and diagonal lines displayed some breakup and a more than average amount of stair-stepping, respectively. No overspray was visible in text and line art. Grayscale was produced over the full range with distinct separation between all levels, while coverage within halftone levels had some graininess but no banding. Solids exhibited competitive darkness, as well as average consistency of coverage.

Copy Quality

Text	Good
Line Art	Good
Halftone Pattern	Good
Halftone Range	Excellent
Solids	Good
Color Business Graphics	Good
Color Photographic Images	Good

Color Copy Density Readings

	Original Density	Copy Density
Cyan	1.61	1.27
Magenta	1.46	1.14
Yellow	1.03	0.79

Density of copied image when tested in the default mode using a KATUN test original containing blocks of all solid colors (based on the average of two readings for each color).

Color Fidelity Readings

Cyan	6.20
Magenta	5.90
Yellow	4.52
Red	9.51
Green	13.08
Blue	12.68
Black	3.43

Color fidelity of a copy to its original (using a KATUN test original containing blocks of all solid colors: tested in walkup mode using the default settings in full-color mode and auto-exposure settings); average of two readings for each color. Measurements are taken with a Minolta CM-503i spectrophotometer. The closer the number is to 0, the closer the copy's color fidelity is to the test original (based on the average of two readings for each color).

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Copy Density

Original	1.69 to 1.74
HP Color LaserJet Enterprise CM4540f MFP	1.22 to 1.32
Density for devices in this class tested to date	0.90 to 1.89

Measurements are based on two readings corresponding to two different solid black locations on the output. The higher the density, the darker the image.

Visible Halftone Range

HP Color LaserJet Enterprise CM4540f MFP	15 to 100%
Halftone increments on test original	15, 29, 53, 77, 83, 91, 95, 100%

The halftone range test original consists of eight blocks of increasing dot-fill levels.

△ COLOR/BLACK PRINT PRODUCTIVITY — VERY GOOD/GOOD

+ While efficiency when printing BLI's job stream, which replicates typical traffic in a multiuser environment, in color mode is competitive compared with legal-size color laser/LED printer MFPs in this class, actual running speed is faster than average.

○ Though efficiency when printing the job stream in black mode is below average for the group, actual running speed is competitive.

○ Productivity when printing multiple sets in color and black simplex and duplex modes is competitive for the group.

○ While first-print time for the TIFF file is among the fastest in the group, those for the other four files are competitive.

+ First-page time from overnight sleep is much faster than the average of the group.

First-Page Time from Energy-Save Mode

HP Color LaserJet Enterprise CM4540f MFP	23.12
Tested Competitive Average	57.43

Device sits idle overnight; a single-page black Word document is sent to the device; first-print time indicates the time it took to RIP the image and deliver the first page of the test document to the output tray.

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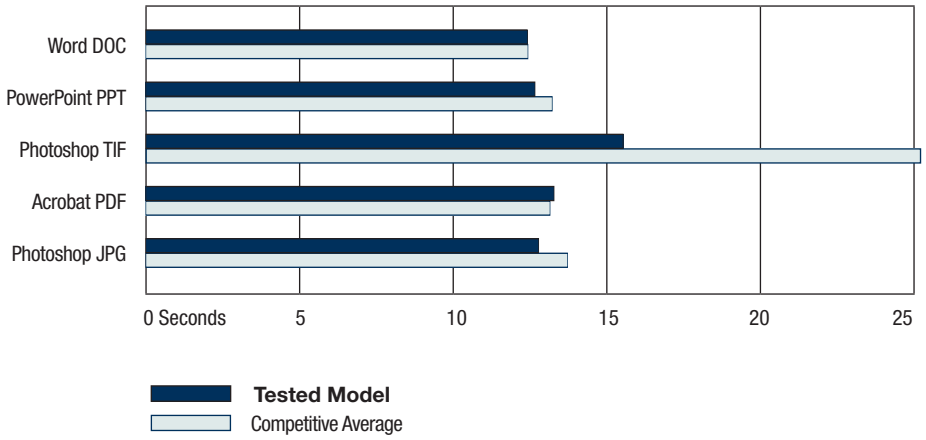
First-Page Times by File Types | Competitive Average

Windows XP		Pre- / Post-Raster File Size		Time in Seconds	
Word DOC	Black Text	114	43.2	**12.44**	12.46
PowerPoint PPT	Color Graphic/Text	99	114	**12.69**	13.25
Photoshop TIF	Color Graphic	20,480	1,751	**15.56**	25.24
Acrobat PDF	Black Graphic/Text	426	213	**13.31**	13.18
Photoshop JPG	Color Graphic	245	152	**12.81**	13.71

First-print time indicates the time it took to RIP, image and deliver the first page of the test document set to the output tray. The unit's print speeds were tested at the default 600 dpi using the PCL driver.



Average Print Productivity | Competitive Average

	SPEED IN PPM		PERCENT OF RATED SPEED	
FULL COLOR				
1:1	**31.4**	29.6	**74.6**	79.2
1:2	**26.8**	25.7	**63.8**	68.7
BLACK				
1:1	**30.1**	30.4	**71.6**	77.6
1:2	**27.7**	26.8	**66.1**	68.0

Efficiency is tested using a 10-page full-color document and a 10-page black document. BLI obtains the overall efficiency for each mode by averaging the efficiency ratings (derived by dividing the tested speed of the device by the rated speed and then multiplying by 100) for each run length (1, 5 and 10 sets). The unit's efficiency was tested using the PCL driver.

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Job Stream | Competitive Average

PCL	SPEED IN PPM		PERCENT OF RATED SPEED	
FULL COLOR	**27.0**	22.9	**64.4**	63.4
BLACK	**24.1**	27.3	**57.4**	70.4

BLI's job stream includes Word documents, Outlook e-mail messages, Excel spreadsheets, PowerPoint, HTML and Acrobat PDF files, totaling 19 pages. This test simulates the type of traffic a typical device might experience in a real-world, multi-user environment. All of the files are sent to the device as a group, at which time the stopwatch begins; timing ends when the last page of the last file exits the device. Job stream efficiency is determined by the percentage of the rated speed at which the device operates when producing real-world jobs. The closer the rate is to 100%, or if it exceeds 100%, the more efficient the device.

△ COLOR/BLACK COPY PRODUCTIVITY — GOOD

+ Productivity when copying multiple sets in 1:1 auto-color mode is above average compared with legal-size color laser/LED printer MFPs in this class tested to date. While efficiency when printing multiple sets in 1:1 full-color mode is competitive for the group, actual running speed is faster than average.

○ Productivity when printing multiple sets in all other auto-color, full-color, and black modes is competitive for the group.

○ Full-color, auto-color, and black first-copy times from the platen and document feeder are competitive for the group.

Average Copy Productivity | Competitive Average

	SPEED IN PPM		PERCENT OF RATED SPEED	
AUTO COLOR				
1:1	**32.9**	24.7	**78.5**	65.0
1:2	**17.2**	19.6	**41.0**	52.3
2:2	**17.7**	19.7	**42.3**	50.9
FULL COLOR				
1:1	**33.0**	28.4	**78.4**	75.8
1:2	**26.0**	23.3	**61.8**	62.0
2:2	**25.6**	24.7	**60.9**	65.7
BLACK				
1:1	**33.1**	30.6	**78.8**	78.0
1:2	**28.1**	25.6	**66.8**	65.3
2:2	**24.4**	25.6	**58.1**	64.8

Efficiency is tested using a 10-page full-color document and a 10-page black document. BLI obtains the overall efficiency for each mode by averaging the efficiency ratings (derived by dividing the tested speed of the device by the rated speed and then multiplying by 100) for each run length (1, 5 and 10 sets). The unit's efficiency was tested using the PCL driver.

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First-Copy Time in Seconds

	HP Color LaserJet Enterprise CM4540f MFP	COMPETITIVE AVERAGE
AUTO COLOR		
Platen	12.58	12.74
Document Feeder	12.33	13.42
FULL COLOR		
Platen	12.66	12.91
Document Feeder	12.75	13.76
BLACK		
Platen	12.50	11.66
Document Feeder	12.39	12.28

EASE OF USE

VERY GOOD

+ Using the HP Easy Select control panel is a breeze. There are a host of hard keys, including a numeric keypad for entry of credentials to release secure print jobs, for example, and LEDs for Attention, Data, and Status, as well as one in the Start key; an LED on the document feeder illuminates when a document is properly loaded and ready scan. Navigation of the touch-screen display, which can be customized by anybody with a password, is simple, and users can view toner status by moving through the menu system. Having icons and text in several places is also welcome, helping users quickly perform walkup functions.

HP Color LaserJet CM4540 MFP
Processing... Copy 649 of 720
Copies: 1
Quick Sets
Access preset job options for commonly used jobs
Initial Setup
Enable functions and customize the device
Copy
Make copies from an original document
Fax
Send a document to one or more fax numbers
Mar/14/2011 4:16:53 PM

HP Color LaserJet Enterprise CM4540f MFP Control Panel

+ Adjusting the drawers for different-size paper is simple; tabs must be pressed to move the length (not removable) and width (slide in sync) guides. And with no corner separators or spring-loaded ramps, loading media is a snap. While the unit auto-detects paper size, users must still confirm it via the display.

+ Clearing misfeeds from any of the seven access areas, including two each in the document feeder and finisher, is easy. Consumables aren't exposed, nor do they need to be removed, and graphical, step-by-step instructions on the display guide users through the routine.

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+ Replacing print cartridges is clean. Users open the front cover and can then simply pull out the spent cartridge and insert the new one. While color-coding further assists users, cartridges aren't "keyed" to prevent them from being placed in the wrong slots; however, an alert on the display lets users know that there's an error. Illustrations on the packaging and inside the cover provide guidance, should it be required.

FEATURE SET

VERY GOOD

○ While non-upgradeable RAM capacity of 1,280 MB is above average compared with the average standard capacity of legal-size color laser/LED printer MFPs in this class, it's below average compared with the average maximum capacity.

+ The unit has a standard HP High Performance Secure Hard Disk Drive, with a capacity of 250 GB.

+ Standard paper (1,100 sheets) and maximum (2,100 sheets) capacities are above average and competitive, respectively, for the group; both figures include the bypass.

+ Media-handling from the drawers, at up to 120-lb. index, is above average for the group.

○ Like every device in this class, the unit has a 100-sheet bypass and accommodates up to a competitive 120-lb. index.

○ The ADF has a competitive 50-sheet capacity.

+ The Sleep Schedule allows users to configure the unit to automatically go into or wake up from sleep mode at specified times.

+ The standard 900-sheet, 3-bin finisher can staple up to 50 sheets in one position.

+ Standard automatic duplexing contributes to less paper waste.

+ Users can build jobs that have more sheets than the document feeder can accommodate. Different settings can be applied to the various page ranges, though the entire job must originate from either the document feeder or platen.

+ ePrint functionality allows printing from smart phones and tablet PCs by e-mailing documents to the unit, which BLI believes is a very nice thing to have in today's increasingly mobile business world.

+ Optional ePrint Enterprise allows users to print from Palm and Blackberry devices to any printer on the same network.

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Via the embedded Web server, administrators can install solutions from third-party developers to expand the unit's functionality, including for document workflow management and specialized security features designed for the fleet.

+ HP FutureSmart provides consistent firmware code across its current line of devices, and provides for simpler upgradeability to extend product life and upgrade functionality.

+ HP Instant-on technology requires less energy to reach fusing temperature.

○ The unit can be outfitted with an optional wireless connection.

○ HP Eco Solutions Print Console provides a place where administrators can manage paper and supplies, as well as energy consumption.

△ SECURITY FEATURES

NOT RATED

Administrator password length (characters)	16 alphanumeric
Authentication	
Network user authentication	Yes
Windows	Yes
Novell NetWare NDPS	No
LDAP authentication	Yes
802.1x wireless authentication	Yes
Kerberos protocol support	Yes
Authentication via department or user ID codes that are registered on the machine	Yes
Number of codes	1,000
Restrict usage of color	Yes
Restrict usage of other features	Yes
Authenticated printing	Yes

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Common Criteria Certification	Pending
Control panel lock/disablement	No
Digital user signature	Yes
Encrypted PDF mode/encrypted scanning	No
Encrypted secure print	Yes (with UPD 5.3)
Hard drive encryption	Yes
Hard drive lock	Yes (for hard drive accessory)
Hard drive overwrite	Yes
Max number of overwrites after every job	3
Overwrite method	DoD 5220-M, SP800-88-compliant
IP address filtering	Yes
IPsec	Yes
Job logs (e.g., activity monitoring, compliance auditing)	Yes
MAC address filtering	Yes
Password-protected mailboxes	No
Password-protected Web page	Yes
Port disablement	Yes
Removable hard drive	NA
Secure fax	
Encrypted TX/RX	No
Fax forwarding	Yes
Fax line access prevention	No
Fax memory lock	Yes
Confidential mailbox	No
Secure print	Yes (with UPD 5.3)
Secure Sockets Layer (SSL)	Yes
SNMPv3 support	Yes
Third-party security features	None
Transport layer security	Yes
Unauthorized copy prevention (secure watermark)	No
USB block	No
Additional security features	IEEE 802.1x

ENVIRONMENTAL FEATURES

NOT RATED

Specified capable of running 30% post-consumer recycled paper	Yes
Specified capable of running 50% post-consumer recycled paper	Yes
Specified capable of running 100% post-consumer recycled paper	Yes
Instant/Quick Fusing	Yes
Duplexing	Yes
Toner-save mode	Yes
Energy-save mode/modes	Yes
RoHS compliant	Yes
Percent of product made from previous devices	INA
Percent of product made from post-consumer materials	INA

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Percent of product made from pre-consumer materials	INA
Percent of product made from bio-based materials	INA
Product designed for recycling (easily disassembled, no binding agents)	Yes
Items that can be recycled	>90 percent of product mass
Hardware remanufacturing program for this product	Yes
Toner cartridge recycling program for this product	Yes
Prepaid label for return of toner cartridges/bottles for this unit	Yes
Toner recycling system	Yes
Ability to program features such as duplexing and auto shut-off over entire fleet	Yes
What tool can be used to do this?	Web Jetadmin
Green packaging materials for the product	Yes
Green packaging materials for its consumables	INA
Packaging materials used	INA
Typically, who is responsible for getting rid of packaging materials after products are shipped to the customer location (e.g., customers, dealers, shippers)?	Customers
Eco-Label Certifications	
ENERGY STAR	Yes
Other	The Eco Declaration, Blue Angel UZ122 (base model)
Tested energy consumption levels of the device (watts)	
Ready/Idle	INA
Energy-save	1
Sleep mode	1
During Printing	780
How fast can this product be programmed to go into the following modes (seconds)	
Ready/Idle	INA
Energy-Save	180
Sleep mode	180
Can the above settings be programmed by a walkup user?	Yes
First-print time out of sleep mode (seconds)	21.5
Emissions output from this device for the following substances (mg/h)	
Ozone	<1.5
Styrene	<1
Benzene	<0.05
TVOC	<10
Dust	<4
Other	None

TONER YIELD

VERY GOOD

+ Based on an average of two cartridges per color, tested yields for black and yellow are above average compared with legal-size color laser/LED printer MFPs in this class tested to date, while those for cyan and magenta are competitive

+ The average tested yields for all colors exceeded the declared specifications by wide margins.

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+ Tested impression-per-gram yields for all colors are above average for the group.

Tested Toner Yield | Competitive Average

	Black		Cyan		Magenta		Yellow	
Tested Impressions	**22,164**	17,714	**16,262**	16,287	**16,482**	16,520	**17,669**	16,750
Tested Impressions / Gram	**89.93**	60.86	**88.07**	74.32	**87.28**	74.58	**98.79**	74.12
Rated Yield	**17,000**	14,167	**11,000**	13,333	**11,000**	13,333	**11,000**	13,333
Rated Drum Yield	**17,000**	27,172	**11,000**	20,864	**11,000**	20,864	**11,000**	20,864

Tested impressions is based on an average of two cartridges per color (high-yield black, standard-yield for cyan, magenta, and yellow) using the ISO 24712 five-page toner yield test original. Some devices in the competitive group employ a cartridge that includes the toner and drum in a single component. In those cases, rated toner yield is used as the rated drum yield in calculating the average.

△ VALUE — VERY GOOD

+ The unit carries a purchase price that's lower than average compared with similarly equipped legal-size color laser/LED printer MFPs in this class.

○ Supplies cost per page is competitive compared with legal-size color laser/LED printer MFPs in this class tested to date.

+ Combining the low purchase price and competitive cost per page with ePrint functionality, solutions-readiness and extensive color access controls, BLI believes the unit offers very good overall value.

Tested Supplies Cost per Page

	Black	Cyan	Magenta	Yellow	TOTAL
Toner Cost per Page	0.902¢	1.537¢	1.517¢	1.415¢	5.371¢
Supplies Cost per Page					5.711¢
COMPETITIVE AVERAGE					5.957¢

Toner CPP is based on HP's Web pricing for the high-yield black cartridge and standard-yield cyan, magenta, and yellow cartridges and BLI's tested toner yields. Supplies CPP adds the rated yields of the fuser kit, transfer kit, and the toner collection unit.

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SUPPORTING TEST DATA

Test Environment: This product was tested in BLI's 10,000-square-foot test lab, in an environment monitored by a Honeywell Temp/RH chart recorder, which replicates typical office conditions.

Test Equipment: BLI's dedicated test network, consisting of Windows 2000 and Microsoft Exchange servers, Windows XP workstations, 10BaseT/100BaseTX network switches and CAT5 cabling.

Test Duration: Products are tested for two months, one month of which consists of a durability test during which the product is run at its manufacturer-rated maximum monthly volume, with daily volumes divided evenly over the course of the test.

Tested Configuration: HP Color LaserJet Enterprise CM4540f MFP base unit.

Test Procedures: The test methods and procedures employed by BLI in its lab testing include BLI's proprietary procedures and industry-standard test procedures, including a BLI-developed variation of ASTM's 1318-90 Test Method for Determination of Productivity using Electrostatic Copy Machines. In addition to a number of proprietary test documents, BLI uses an industry-standard Katun test original for evaluating black image quality and test suites from Quality Logic to evaluate applications compatibility. In addition to a visual observation, color print quality is tested using the ANSI standard IT8 Color Test Target, which is read using the Minolta CM503I Spectrophotometer, and samples are analyzed using the CIE XY Chromaticity Diagram. In addition, density of black and color output is measured using an X-Rite 428 Densitometer. Georgia-Pacific Spectrum Multi-Use 20-lb. bond is used in the tests, 10 percent of which is recycled paper containing 30 percent post-consumer content. Image quality is tested using Georgia-Pacific Printing Paper (95 brightness, 22-lb. bond).

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Certificate of Reliability

Awarded to

HEWLETT-PACKARD COMPANY

for the performance of the

HP Color LaserJet Enterprise CM4540f MFP

in BLI's in-house durability test.

Anthony F. Polifrone
Managing Director

June 2011
Date

This is to certify that when subjected to an approximately 87,500-impression Buyers Lab durability test, the HP Color LaserJet Enterprise CM4540f MFP proved to be a highly reliable product.

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